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In this study we examine the key management and scientific traditions that inform the logical framework, a project planning and evaluation tool that is central to how many non-governmental organizations (NGOs) manage their projects and provide accounts to funders. Through an analysis of USAID reports from the 1960s and 70s, interviews with the logical framework's developers, and a close reading of seminal texts, we identify how systems theory, management by objectives, and scientific theory informed how USAID problematized its project planning and evaluation practices and how they came to be inscribed into the logical framework as a way to address such perceived problems. We argue that these traditions are important for understanding a particular strand of managerialization that informs international development NGOs, and, more generally, for understanding how funding agencies "see" through the logical framework.

Keywords: Logical Framework, managerialism, state, non-governmental organizations (NGOs)

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1. Introduction

Non-governmental organizations (NGOs) are a principal vehicle for global development interventions (Barnett 2011; Banks et al. 2015). Often, funding agencies have a direct influence on how NGOs do their work (Brown and Gaughlin 2006; Banks et al. 2015). One way of doing so is through performance measurement and accountability requirements such as logical frameworks, budgets, evaluations, and strategic and operational plans, which NGOs often have to implement because of pressure from institutional donors (Wallace et al. 1997, p. 31; Martinez and Cooper 2017; Neesham et al. 2017, p. 199). The logical framework (hence, LF), a project planning and evaluation tool, has a long and pervasive impact in international development (Hummelbrunner 2010; Hall 2014; Krause 2014; Fernando 2015; Martinez and Cooper 2019). It has been used at one time or another by state development agencies such as the United States Agency for International Development (USAID) and the German Corporation for International Cooperation GmbH (GIZ) and multilateral agencies such as the World Bank and the United Nations Development Project (UNDP). Further, international NGOs, such as CARE and Oxfam have adopted versions of the LF, alongside countless local NGOs implementing projects funded by state agencies and international NGOs (Wallace et al. 2006; Ebrahim 2002).

Studying the LF permits us to start addressing the call that "[A]ttention must be paid to the theory and paradigms that underpin current aid practices" (Wallace et al. 2006, p. 3). This is important because theories and paradigms impact the way we both

represent and intervene in the world (Hacking 1983), and as Scott (1998) has so dramatically demonstrated, theories of modernization impact how development activities and solutions are seen and understood because they inform a way of seeing (see also Li 2007; Ferguson 1994). As several commentators have shown, visual representations not only frame issues but offer an approach to managing the issues (Busco and Quattrone 2015).

The modern state "sees" through information and measurement systems that make populations legible according to its model (Scott 1998). State bodies, such as international development agencies, intervene around the world in the name of "development" through, inter alia, management tools which represent and constitute a particular type of beneficiary (Krause 2014) and field of intervention (Martinez and Cooper 2017). Through tools such as the LF the state sees NGO projects at a distance, as funding agencies require NGOs to use it to plan, monitor, and evaluate their development projects (Rottenburg 2009). Through it, users can fit the dynamic world of development into "grids," where "exceptionally complex, illegible, and local social practices […] could be centrally recorded and monitored" (Scott 1998, p. 2). Unlike Scott and others (Krause 2014; Martinez and Cooper 2017), we don't study how such grids constitute populations, but focus on how the grid itself has been constituted by analyzing the scientific and management traditions that are visually inscribed into the LF—into the "scripts" that inform its usage (D'Adderio 2008). It is through such a visibility tool that the state and aid agencies make the site of intervention, such as the project, in its scientifically and managerially-informed image (Busco and Quattrone 2015).

Since the 1970s, the LF has become one of the more ubiquitous project management tools in international development, and while it has been widely studied and critiqued (Wallace et al. 1997; Wallace et al. 2006; Ebrahim 2002; Fernando 2005; Hall 2014; Krause 2014; Martinez and Cooper 2019; Fujita 2010; Gasper 2000), little work has been done on the dominant paradigm and theories that informed it. Through a review of USAID archives, interviews with actors central in the development and popularization of the LF, and the analysis of texts that were influential in the 1960s, we identify and explore the salient traditions of systems theory, management by objectives, and scientific theory. We trace how these management and scientific traditions are implicated in problematizing evaluation in USAID in the 1960s and how they were, and are, made persistent in international development by being inscribed into the LF's 4 x 4 template. Through this, we contribute to the study of the LF and the managerialization of non-profits in two ways.

First, we identify the management and scientific traditions implicated in problematizing evaluation in USAID and visually expressed in the LF. This is important because we learn how ideas are woven together and are visually consolidated in the LF (into the "scripts" that inform its usage). Studies have examined how the LF plugs into a suite of project management devices such as budgets, operational plans, and strategic plans, facilitated through the devices' visual features, labels, and orders (Martinez and Cooper 2019). Studies have also examined the LF in an organizational setting (Ebrahim 2002; Fernando 2005) and in the broader field of international development (Krause 2014; Wallace et al. 1997; Wallace et al. 2006). These studies have shown that the LF depoliticizes and prioritizes interventions with measurable objectives, thereby affecting the focus and work of

NGOs. Although Krause (2014) and Fernando (2005) shed light on the debates in USAID around project evaluation and planning that gave rise to the LF, they do not explore the traditions that informed this particular way of viewing the problem and how these traditions, these theories, are visually inscribed into the LF.

Second, our device-oriented focus contributes to the study of managerialization in the non-profit sector (Roberts et al. 2005; Jones et al. 2011; Hvenmark 2015). We know that managerialization has been diffused in nonprofits and that funders, such as the state, significantly impact the sector they finance through accountability requirements (Martinez and Cooper 2017; Brown and Gaughlin 2009). But studies of the managerialization of non-profits often define it as "corporate management" (Hvenmark 2013) or "organisational management" (Jones et al. 2011, p. 633), with little reference to project management's close linkages to the foundational traditions of the 1960s in the US government. Our study of the LF allows us to trace the traditions that inform a particular brand of managerialism in USAID. It is important to trace these traditions because, as we have learned from the literature on managerial discourses, they give an aura of rationality to decision-making without interrogating the type of rationality (Townley et al. 2003) and displace other forms of expression, thereby changing how users think about and do their work (Oakes et al. 1998). Part of this power materializes these discourses as visual graphs, such as the LF's matrix or the four perspectives of the Balanced Scorecard, to "motivate certain actions" and foster a particular "range of interpretations" (Free and Qu 2011, p. 159).

The paper proceeds as follows. In the next section we position the paper in the NGO managerialization and LF literatures. In section 3 we discuss James Scott's (1998)

analysis of how the state "sees" and the study of how dominant traditions are inscribed into tools such as the LF. In section 4 we describe our methodology. This is followed by section 5, where we describe how the LF is problematized and the traditions that inform it. Finally, in section 6, we present our discussion and a concluding statement.

2. The LF and the managerialization of development

While there are studies of the many management and administrative tools (such as cost benefit analyses, social return on investment, and program evaluation) that have been used in international development and non-profits, studies have identified and analyzed the centrality and ubiquity of the LF and its variants over the last few decades (Hummelbrunner 2010; Gasper 2000; Martinez and Cooper 2019; Fernando 2015). The LF has been the subject of numerous critiques based on the examination of what the LF does, rather than what it aims to do in international development and in specific organizations. Edwards and Hulme (1996, p. 968) write that LF approaches have been "overemphasizing short-term quantitative targets and favoring hierarchical management structures." For Ebrahim (2002, p. 98) the LF is a "technocratic tool: It organizes and reduces complex social and political realities into simplified and discrete components of a 'project'". Similarly, Wallace et al. (2006) argues that the LF is an inflexible tool that favors managerial-technical expertise and excludes those components that don't comply with its rational framework. For Gasper (2000, p. 17), "logframes are inevitably simplifications" that are "prone to rigidification and thus to blocking rather than aiding adaptation."

Others have studied the LF's claim to neutrality by examining how managerialism and science inform it. Krause (2010; 2014) positions the LF as part of a wave of results-based management reforms that sought to hold development agencies accountable and constituted beneficiaries as the object of development intervention. Fernando (2015) provides an account of the events around the formation of USAID that both "formalised" the delivery of development and gave rise to concerns over proper project evaluation. Central is that the LF was proposed in the dawn of the 1970s as a formal and "neutral instrument" to evaluate USAID projects. Hall (2014, p. 321) shows how the LF is informed by the scientific method with its "strong focus on systematic observation, gathering of observable and measurable evidence, and a concern with objective and robust experimental procedures."

There are also studies that ground their analysis on the LF's visual features as a way to study its effects. Martinez and Cooper (2019) examine how the LF's design enables users to connect it to a constellation of other management devices that work on, and with, other devices, for example budget, operational, and strategic technologies. They argue that the LF is not neutral because its visual features enable other functionalities, while occluding other possibilities. We draw on their emphasis on the visual and connective aspects of the LF in analyzing the traditions that impact its development and pervasiveness.

Like Fernando (2015) and Krause (2010; 2014), we consider the debates in USAID to develop a better evaluation tool. Yet, while they identify that USAID sought to address problems with project planning and evaluation and the LF's "multi-disciplinary origins (military, science and management)" (Fernando 2015, p. 25), we

don't really get a sense of how they make their way into the LF. We ask: Where are these ideas in the LF? Hall (2014) provides evidence of how science is articulated in the LF, but we argue there is more to it than science. Our aim is to precisely describe the management and scientific traditions that are (a) implicated in problematizing evaluation in USAID and (b) inscribed, that is, visually articulated, in the LF itself. This enables us to trace how systems of thought are interwoven in time and place (in USAID), and visually, into the LF.

This device-oriented approach to studying the history of foundational traditions contributes to our understanding of the "theory and paradigms that underpin current aid practices" (Wallace et al. 2006, p. 3). Such theory and paradigms have been diffused through new public management reforms since the 1980s (Hood 1991). These reforms intensified NGOs' reliance on state funding (Edwards and Hulme 1996) and their adoption of "centralized and standardized measurement frameworks and practices for reasons of compliance" (Neesham et al. 2017, p. 199) and managerial discourses and practices (Jones et al. 2011; Meyer et al. 2012; Hvenmark 2013). But as Hvenmark's (2015) review finds, "even if managerialism seems to play an important role in studies of how modern organizations both within and outside civil society change it is not always clear what it means" (p. 2836). Our purpose is not to contribute an all-encompassing definition of managerialism, or to evaluate it, but to rather trace how a particular brand of managerialism is inscribed into a device that is deployed throughout the development world.

3. Seeing through the LF grid

Our starting point is that the modern state "sees" by standardizing otherwise complex

social interactions into a "convenient, if partly fictional, shorthand" (Scott 1998, p. 24). To see a population, the state has to be able to identify the things that it deems relevant to see. To do so, state officials record complex social phenomena into a simplified grid (Scott 1998, p. 2; Jasanoff 2004). For example, censuses and tax forms render diverse populations into categories such as man/woman, single/married, rural/urban, employed/unemployed, and various income brackets. This is not just about a population of people, this can be done also to a population of trees. Scott illustrates this through the case of forest management, the constitution of a "forest that was easier for state foresters to count, manipulate, measure, and assess" (p. 15). He continues:

> The tendency was toward regimentation, in the strict sense of the word. The forest trees were drawn up into serried, uniform ranks, as it were, to be measured, counted off, felled, and replaced by a new rank and file of lookalike conscripts. As an army, it was also designed hierarchically from above to fulfill a unique purpose and to be at the disposition of a single commander. At the limit, the forest itself would not even have to be seen; it could be "read" accurately from the tables and maps in the forester's office. (Scott 1998, p. 15)

The state does not just record the world through its (inevitably) simplified model, but imposes its grid-like model onto forests, towns, cities (and development projects). Similar schemes to record and manage are deployed by organizations to manage their objects of interest. Such organizations are not necessarily a monolith, a unitary brain: for example, interventions are by "not only the state apparatus but also an array of authorities"—there are scholars and consultants involved in developing state

ambitions, interventions, and tools (Li 2008, p. 383). Moreover, Scott mainly investigates how the state represents and intervenes to exercise a modernist political ambition, our interest is in the production of the tools to govern and "intervene at a distance" (Miller and Rose 1990; Latour 1987). Focusing on the tools is important. A development agency's planning and evaluation office is at the center of a network of knowledge accumulation and control "through a range of devices, instruments, calculations and inscriptions" (Miller and O'Leary 2007, p. 707).

This broad view of the state, including other authorities, and the centrality we give to how state tools are developed, sensitizes us to the scientific and management ideas and the role of consultants in problematizing state planning and evaluation practices and how these are subsequently inscribed into the LF. Recall that the LF is a gridding tool; a matrix that represents intentions, populations, and projects and places them into a certain order. Our interest, then, is to study how this gridding tool is informed by particular forms of thinking, by specific aspirations, by particular modes of improvement (Miller and Rose 1990; Li 2007). We trace how specific forms of thinking make their way into a project management tool's visual characteristics (Pollock and D'Adderio 2012; Martinez and Cooper 2019; Free and Qu 2011). For D'Adderio (2008, p. 11), devices contain a "complex range of rules and assumptions […] embedded within technology both at the design and usage stage." At the center of our study is to investigate the dominant scientific and management "rules and assumptions" that are inscribed into the device itself. When these ideas are consolidated into 4 x 4 matrix such as the LF they become deployable and gain a certain scientific and rational aura that informs the way people think and act (Oakes et al. 1998; Free and Qu 2011; Latour 1987).

To summarize, Scott (1998) helps us understand how the state represents and imposes a simplified grid-like model on a population. We however are sensitive that there are more "authorities" implicated in this than "just" the state (in our case scientific and management ideas and consultants) and to the importance of studying the tools of state intervention—of studying the theories and paradigms that inform the grid. This provides some needed insight into the study of managerialism in international development because it goes beyond saying that the state has been informed by private sector managerial discourses and technologies, to more precisely map out how these traditions and related principles[1] inform the *need for* and the *design of* the LF, as well as the actions of those involved in development work.

4. Method

We consulted USAID archives, conducted interviews with actors central to the development and popularization of the LF, and analyzed relevant and important texts of the traditions that were influential in the 1960s. Before describing our sources in more detail, it is worthwhile to briefly describe the object of our analysis.

The LF template has horizontal and vertical dimensions (see Figure 1). The vertical axis includes the project's narrative or hierarchy of objectives: An if-then, hypothesis-based, relationship between *program goals*, *project purpose*, *output*, and *activities/resources*. At the very top of the hierarchy of objectives we find the goal, which states the program's objective to which the project contributes. The project

[1] Each tradition (e.g. system analysis) has principles (e.g., a system is part of larger systems, and/or a system is defined by its objectives). These principles, as we will show, informed the LF.

purpose describes the expected effect, and the outputs are the results achieved through activities. The activities/resources include the processes carried out and the inputs used. The horizontal axis is mainly used to monitor and evaluate the project. That is, each project is monitored through the *objectively verifiable indicators*, *means of verification*, and *assumptions* columns: what information is to be produced; what evidence is available to project designers, executers, and evaluators to measure success; and what factors (risks, uncontrollable factors, and assumptions) may affect project completion.

[Insert Figure 1 here]

Learning about the dominant traditions that informed the LF required accessing and analyzing the reports that problematized project planning and evaluation in USAID and that proposed the LF as a solution. These include reports by Fry Consultants Inc., which later became Practical Concepts Inc., the consulting firm responsible for submitting reports to USAID from 1970 to about a 1987 on a variety of management and training programs. The planning and evaluation problems identified by Fry Consultants Inc. and Practical Concepts Inc., though, can be traced back to the 1960s. We consulted a handful of late USAID 1960s reports that were referenced by subsequent ones, and importantly, by the Fry Consultants Inc. and Practical Concepts Inc. reports that followed (see Appendix 1 for list of cited reports). This Appendix provides a map of how ideas about project evaluation and their relationship to planning were articulated over time in USAID. Importantly, these different articulations would make their way into LF-related interventions.

We also conducted interviews by phone/Skype and in person (in Washington DC) with the LF's developers, Leon Rosenberg and Larry Posner. We interviewed

Rosenberg twice in 2011 by Skype and Posner once by phone in 2011 and once in person in Washington DC in 2012, where he granted us access to his personal archives containing his Fry Consultants Inc. and Practical Concepts Inc. files. There were also numerous email exchanges between them and us. We also interviewed two former Practical Concepts Inc. trainers, and three project/program evaluation experts and trainers (see Appendix 1 for list of interviews).

In total we interviewed seven people who provided additional perspective into the LF's history. We adopted a snowball sampling approach, where participants were asked about others who were involved. These interviewees were selected for their involvement with program evaluation and the LF, and their consulting work with USAID and other international development agencies in the 1960s and 1970s. Interviews lasted between 50 and 120 minutes and were digitally recorded and transcribed verbatim. The interviews were semi-structured, covering issues such as: the institutional context and modes of project planning and evaluation before and during the development of the LF, the challenges of introducing and adapting the LF to the organization's needs, and the intellectual traditions and institutional factors that the participants suggested were implicated in how development planning and evaluation were problematized in USAID and how the LF was developed as a possible solution. Interviews were thus not standardized but tailored to the interviewees' interests, experiences, and expertise.

These interviews and reports were analyzed, generally following an anthropological approach (Berg and Lune 2012), to identify and then code the main traditions. Once these traditions became more explicit we carefully examined some of these traditions' dominant texts to learn about their assumptions and claims. For instance, once we

identified that the LF was influenced by systems theory, we immersed ourselves in influential systems theory and cybernetic texts of the time. Management by Objectives (MBO) was also identified by our interviewees, and we traced the principles of this tradition by carefully studying key MBO texts. These traditions also influenced one another, as we will indicate later.

5. Informing the LF

In this section we analyze how planning and evaluation was problematized through a series of reports published in USAID in the 1960s. It indicates how systems theory informed the main critiques of planning and evaluation and how it laid the foundation for further interventions through MBO and science. Analyzing how these ideas and consultants come together to problematize USAID's planning and evaluation helps identify the different "authorities" implicated in this state project. In a subsequent section we will trace how these problematizing traditions are inscribed into the LF itself.

5.1. A systems view of planning.

USAID underwent in the 1960s an important transformation in how it viewed international development. Modernization theories of development (notably, Rostow 1960/1971), which emphasized capital-intensive projects and macro-economic planning, gave way to technical assistance projects in response to the former's perceived failure to increase growth and alleviate poverty (Rondinelli 1993, p. 10). This transformation implicated a new focus on public administration in the name of "institution-building"—an approach to "modernizing governments and of expanding their capacities to carry out development activities more effectively" (Rondinelli

1993, p. 52). It also implicated a need to "develop and program new doctrines and instruments of international cooperation" (Esman and Montgomery 1969, p. 523).

Early in this transformation USAID started to encounter a couple of problems in technical assistance project planning and evaluation. One, that project lessons were not feeding into USAID "memory" and into future planning, and vice-versa. Two, that projects were not feeding into larger programs, and vice-versa. That is, the project, as a system, was not providing feedback, and was not feeding into the larger systems that it was a part of.

Systems theory considers systems as a whole rather than as self-contained parts. The approach is not just a theory for management, but a theory of theories that resonates with systems found in the social and biological worlds (Kast and Rosenzweig 1972, p. 447). All phenomena are systems within larger systems: a hierarchical relationship whereby one system feeds outputs into another larger system, which includes them as inputs. These inter-related systems are goal oriented. For example, "the business organization is a system of interrelated parts working in conjunction with each other in order to accomplish a number of goals" (Johnson et al. 1964, p. 383). Organizational and management scholars, Stafford Beer and Robert Anthony [2] emphasized feedback loops for the proper functioning of systems. This principle is at the center *cybernetics*, "the science of control" (Beer 1959, p. xv), which views the "operational control system as analogous to a thermostat that turns the furnace on and off according to perception of changes in temperature" (Anthony 1965, p. 82). A

[2] Antony worked under Robert McNamara in the Department of Defense, where system thinking was influential.

system provides feedback: it enables managers to intervene to restore order to a system.

Systems analysis and cybernetics were central to the problematization of planning and evaluation in USAID. An important starting point is the 1965 Booz Allen Hamilton report commissioned by USAID to conduct a "broad reconnaissance study" (Booz Allen Hamilton 1965, n.p.) of the agency's planning and evaluation. The report states that evaluations for both capital and technical assistance projects were "sporadic" and provided "little feedback" (p. 38). The concern with the lack of evaluation and learning was seen as a problem of memory: "It has often been said that AID has an inadequate memory" (ibid, p. 38)—there was no "evaluative memory" (ibid, p. 88). They essentially identify a cybernetic problem: that there is "little joint planning or feedback of earlier successes and failures into the current review processes" (ibid, p. 39). In the name of feedback, Booz Allen Hamilton suggest, that USAID needs to improve evaluation, the output of which, should *feed*, as input, into USAID memory.

Soon after, in October 1965, Special Advisor to the Administrator Agency for International Development, Colonel George Lincoln, a West Point faculty member, released a report also stressing the need for internal evaluation in the agency. The report proposes an "emphasis on program evaluation as a basis for bringing further improvements in programming [i.e., planning] and implementation" (Lincoln 1965, p. 151). In contrast to the previous report, though, this one stresses that evaluation, should *feed*, as input, into "improved program execution as much as to improved planning" (ibid. p. 12), and not just memory.

The Agency worked on the Booz Allen Hamilton and Lincoln suggestions for a couple of years, including the introduction of a task force and the adoption of "work plan and progress evaluation efforts" at several of its missions (USAID 1966, p. 52). In 1967 Joel Bernstein, then Special Assistant to the Administrator, was asked to supervise the "design of an evaluation system" (Bernstein 1968, p. 5). His 1968 report links programming ("planning"), implementation ("doing it"), and evaluation ("examining what actually happened"). Whereas Lincoln notes that evaluation should feed into planning future projects, Bernstein notes that "evaluation planning should be linked to activity planning (or programming) from the start" (ibid. 1968, Tab B, p. 57). This meant that planning should feed into evaluation, rather than Lincoln's focus on evaluation feeding into planning. Their relationship is problematized differently, yet both are concerned with the feedback principle of connecting planning to evaluation and future projects. One outcome of Bernstein's report is the Project Appraisal Report (PAR) form, "which provides a check list on progress and an analytical narrative" for non-capital projects (Bernstein 1968, p. 668 [p. 7]).

Bernstein's report was followed by another wave of interventions in USAID's evaluation system by Fry Consultants Inc., who were contracted to review Bernstein's suggestions. One of their initial contributions to the problematizations of project planning and evaluation was to more explicitly integrate MBO principles into the system and cybernetic views that had so far informed the analysis.

MBO is often associated with Peter Drucker (1954). The central idea is that each manager at whatever level of the organization requires clear objectives that should be derived from the organization's strategic goals (p. 126). He writes: "the objectives of every manager should spell out his contributions to the attainment of company goals in *all areas* of the business (Drucker 1954, p. 127, emphasis in original). A manager's

performance aims “upward rather than downward” (ibid., p. 128). This link between one unit’s objectives and a higher level unit links management by objectives to systems theory’s hierarchy of systems. Hofstede (1978) notes that with MBO, hierarchically arranged managers can set objectives, conduct performance reviews, and take corrective action (i.e., feedback).

This mode of thinking informed the methodology Fry Consultants used for their “year-long study of the evaluation of non-capital projects” at USAID’s offices worldwide (Fry Consultants Inc. 1970b, p. ii). They developed on Bernstein’s view that proper planning was necessary for evaluation by suggesting that projects be evaluated in relation to the project’s expected objectives, its plan. While Bernstein’s PAR and related tools improved the “quality of design and planning” (ibid. 1970a, p. 6), the consultants objected that it was “annoying to fill out” (ibid. 1970a, p. 16), showed “confusion about project purposes and superior objectives” (p. 10), and had a “lack of clear targets” (p. 12). This confusion is elaborated:

> USAID project personnel are in the position of platoon commanders who don't know what the company objectives are. They have been told to fight well and bravely, and on occasion they have been told to ‘take Hill 414.’ But they have not been told that the company objectives are to create a salient comprising Hills 413, 414 and 415. Lacking such insight into the broader objectives, USAID personnel find it difficult to intelligently replan their projects and their personal efforts. And the ability to replan is key to effectiveness. (ibid. 1970b, p. II-19)

This is a restatement of the cybernetic focus on feedback, but with the introduction of objectives as central for re-planning. The system analysis and MBO intersection, though, is at its most explicit when Fry Consultants Inc. write that PAR's "logic of evaluation" is not "clear," "the higher goals, for which a tabulation is provided, are rarely defined to show or imply a logical connection between project outputs and higher goals" (ibid. 1970b, p. II-4-5). While PAR was designed to feed planning into the evaluation process and vice versa (cybernetic control through feedback), it did not help planners and evaluators link projects and activities to the broader system of objectives they are a part of (linked hierarchy of systems). Fry Consultants Inc., as such, found that projects were sometimes designed without clear objectives in mind. As we will see in the subsequent section, a hierarchy of systems, each with its own objectives, was designed into the LF to address this concern.

Fry Consultants Inc. reports also helped introduce a notion of science into project management at USAID. Science for Fry Consultants Inc. was a way to model (and test) the link between project objectives and program objectives. They argue (see figure 2): "AID programs and projects can be viewed as a series of linked developmental hypotheses. These hypotheses are conveniently stated as linked 'if-then' statements, with the 'then' of a subordinate hypotheses (e.g., 'if outputs, then purpose') being the 'if' of a superior statement (e.g., 'if purpose, then goal')" (Fry Consultants Inc. 1970c, p. II-20). This served as a way to critique projects as not rigorously designed—that is not only did PAR not have clear objectives, it was not good science. As we will show in the next section, this modelling approach provided an important conceptual foundation for the LF.

[Insert figure 2 here]

In this section we show how elements of systems analysis and cybernetics can be found in the reports published by Booz Allen Hamilton, Lincoln, Bernstein, and Fry Consultants in the late 1960s. There were initially two concerns around project evaluation. One, the cybernetic principle of feedback: the concern was about how can USAID learn from its projects and feed these lessons into its "memory" and future projects. Second, the system analysis principle that systems feed into other systems, which Fry Consultants Inc. identified as a significant problem in USAID—projects were not feeding into larger programs. Later, Fry Consultants Inc., identified another problem: that project planning and evaluation was not just a systems and cybernetic problem, but also a problem of how objectives ought to be managed and how the scientific notion of hypothesis can serve as a way to connect systems and their objectives.

These concerns are at the center of the LF. As we will show in the next section, by studying how these traditions informed the problematization of project planning and evaluation practices in USAID in the 1960s, we set the stage for learning how their principles informed the LF itself as a solution and how the state is at the center of these reforms, while also acknowledging the diverse "authorities" (notably consultants) who are not formally part of the state.

5.2. Inscribing the LF

The LF was not the main proposition of the Fry Consultants Inc. 1970 report, but was, "an important part of the recommended systems improvements" (Fry Consultants Inc. 1970b, p. IV-4). According to Rosenberg and Posner, their recommendations received

significant support from within the agency.[3] Riding this wave of support they formed their own consulting firm, Practical Concepts Inc., which was awarded a contract by USAID to revise the evaluation system critiqued in the Fry Consultants Inc. report using the same principles: System theory, MBO, and science.

The LF swiftly becomes a central element of the 1970 USAID *Evaluation Handbook*. We see the LF's visualization as a 4 x 4 matrix and its associated philosophies (as we will develop below) having an impact on the agency's evaluation and planning tools. For example, earlier planning tools such as the Non-capital Project Paper (PROP) from 1967 look quite different from a PROP from 1976, which include the LF grid in its project summary section. Funding proposals were required to frame projects using the LF, which, as a subsequent *Evaluation Handbook* noted, "sets the stage for the evaluation" of projects (USAID 1976, p. 14). Further, the LF became the language of AID through a training campaign in every mission of AID which highlighted its grid to conceptualize and visualize projects (Solem 1987; Practical Concepts Inc. 1981).

The LF thus became a central part in USAID's project planning and evaluation system. For Rosenberg, the LF added "rationality to bureaucracy" and "shows the bright light of reason" (Rosenberg, interview, 2011). In other words the way USAID would *see* how it is intervening at a distance is rationalized through systems theory, management by objectives, and scientific theory. In what follows we show how the ideas used to problematize USAID project management were weaved into the LF. These, ideas are not independent of one another, they influence one another, and one

[3] In an interview, Rosenberg referred to Herb D. Tuner and Robert L. Hubbell, of the agency's Program Evaluation Committee, as the LF's "midwifery team."

finds their intersection in the LF. They are "different points of view [which] can be brought to bear simultaneously, completing rather than opposing each other" (Practical Concepts Inc. 1979, p. II-1).

5.2.1 Systems theory

> "the development of a logical framework for the design of large and complex systems has become of ever more pressing urgency." (Hrones 1964, p. ix)

One of the most explicit traditions that influenced the LF is Systems Theory. For Schmidt (2009, p. 42), a former Practical Concepts Inc. trainer, systems thinking is the "conceptual foundation of the LF." When Fry Consultants Inc. critiqued PAR's "confusion about project purposes and superior objectives" (1970a, p. 10), their concern was that the project system was not clearly connected to higher level systems. The LF is based on the principle that "every project include as part of its definition, the largest system of which it is part" (Rosenberg 1983, p. 7-8).[4] The project, like the program it is a part of, are systems connected to one another, and the LF makes this visually explicit by feeding "project purpose" into "program goal." Rosenberg was well familiar with systems as we learned from interviews and from the 1983 document. Part of it may be traced to his experience working as a contractor for the Pentagon, where, at the time, system analysis was in fashion (Chwastiak 1999, p. 761).

As we learned in the previous section, systems theory informed the problematization

[4] Rosenberg (1983) is a 74-page transcript of Rosenberg talking about the LF, in particular its intellectual antecedents for a Practical Concepts Inc. video workshop. The date is not clear but we believe it is from 1983.

of USAID's evaluation systems through the hierarchy of systems and the principle of feedback. These also informed the LF. To start, the LF was designed to represent projects as components of a larger system. This is captured by one of the most well-known features of the LF: its "narrative summary" column. This column structures the systems and their relationships: the project's inputs should feed into its purpose, which should feed into the agency's programmatic goals. This view requires the project designer to think about the systems' inputs and outputs and their relation to broader systems; the visualization offers a mode of managing the relation between projects and programs.

The LF also inscribes the principles of feedback for evaluation and monitoring. The LF assess what happens in a project (whether the outputs have been achieved as planned), enabling revision and taking corrective action and/or re-planning. For Practical Concepts Inc. (1979, p. II-24) the LF is a tool for project managers to "monitor the progress of the project in relation to the achievement of that purpose." It enables the funding agency and project managers to monitor and, if necessary, to intervene in the project. The cybernetic principle sensitized Practical Concepts Inc. to the problem that there were no feedback loops, no memories created that could feed into and improve future projects and revise ongoing ones. There are however two types of feedback inscribed in the LF. One is "[f]eedback from the real environment that people are trying to influence" (Rosenberg 1983, p. 39). The environment in this case is the project, and through the LF's "objectively verifiable indicators" column, project managers can monitor the extent to which the project activities and results have been advancing or not according to a set benchmark—enabling managers to respond and intervene to restore order to a system. There is another type of feedback

that the objectively verifiable indicators column also enables: “the feedback about how each member deploys himself relative to the other; how well or poorly he is doing vis-a-vis his assigned task” (Rosenberg 1983, p. 46). In this sense, the LF is used to hold project managers accountable for achieving the plan outlined in the LF (we develop on this in section 5.2.3).

The LF is part of the aspiration to create a “culture of program management and not just project management” (Rosenberg, interview, 2011), to place the project in a broader systems-informed grid. The LF’s narrative summary column visually articulated the agency’s program-project administrative structure as two systems that feed into one another. The LF matrix also makes explicit the cybernetic principle of feedback, using project measures such as those in the objectively verifiable indicators column to visually represent the project and the manager responsible for the project. This feedback loop responsibilizes the agency and project managers for planning, monitoring, and evaluating inputs, outputs, projects and programs, and their relations—it exerts a type of control that is intended to be total, rational, and technocratic.

5.2.2 Management by objectives

The LF’s “narrative summary,” also called the “hierarchy of objectives,” is informed by both systems theory and MBO. Through it, the LF visually articulates that each system has its own objectives to be managed. The notion of a hierarchy of objectives precedes the LF. One finds earlier uses of the terms in a *Harvard Business Review* article by Granger (1964, p. 6) who notes, “there is a ranking or hierarchy of objectives, proceeding in concept from the very broad to the specific. Logically, the

specific or more limited objectives should not be in conflict with the broad objectives."

Each system has its own objective, connected through a means-end logic. A former Practical Concepts Inc. trainer, Larry Cooley, suggested that the LF includes a "means-end" thinking and a process of working backwards from broader objective to more specific objectives and inputs. For Herbert Simon, who promoted means-end thinking:

> In the process of decision those alternatives are chosen which are considered to be appropriate means for reaching desired ends. Ends themselves, however, are often merely instrumental to more final objectives. We are thus led to the conception of a series, or hierarchy, of ends. Rationality has to do with the construction of means-ends chains of this kind. (1997/1945, p. 73)

This means-end thinking connects the various systems that compose the LF, providing a "hierarchy of goals or a means-end structure" (Wallroth 1968, p. 110). For example, the LF grid shows that the project's "output" is a means to achieve the objectives articulated in the "project purpose," which in turn feeds into the program level goal.

For Practical Concepts Inc., the LF was a way to introduce MBO into the planning and evaluation of projects:

> Planning was too vague: Objectives were multiple and not clearly related to

> project activities. There was no clear picture of what the project would look like if it were successful. Thus, evaluators could not compare—in an objective manner—what was planned with what actually happened. (Practical Concepts Inc. 1979, p. I-1 emphasis original)

The hierarchy of objectives is the clearest way in which MBO is articulated into the LF's matrix. This provides an important visual feature: The objectives provide a "clear picture" of the connections between the LF's different hierarchical systems and objectives, and, importantly, of project success.

5.2.3 Scientific approach

The scientific approach to management is often equated with scientific management and a quest for efficiency and control of the labor process (Taylor 1903; Braverman 1974). In the LF, however, we find science invoked around the principle of hypothesis testing, an approach that we find in contemporary management devices such as strategy maps: "The cause-and-effect logic of this design constitutes the *hypotheses of the strategy*" (Kaplan and Norton 2001, p. 69; emphasis original). This sensitivity to science aimed to turn "management art into a management science" (Rosenberg 1983, p. 11).

The scientific method's influence on the LF is made explicit in early Fry Consultants Inc. and Practical Concepts Inc. reports. For example:

> The concepts [in the manual] draw heavily from science, and experience gained from the management of complex space age programs, such as the

> early satellite launchings and the development of the Polaris submarine. Most importantly, the concepts help one apply basic scientific methods (including hypothesis formulation and testing) to program/project management and are complementary with other management tools. (Practical Concepts Inc. 1979, p. I-2)

The LF reframed management by objectives' means-end approach into a set of "developmental hypotheses," a way to specify: *If* the project intervenes and assumptions are correct, *then* the outcome should be delivered. For example, if activities (build water pump and conduct an awareness campaign), then output (pumps are built and functional, and people are aware of hygiene and sanitation). This hypothesis-based thinking is explicit in the LF grid: if activity, then output; if output, then purpose; if purpose, then goal.

The purpose of linking these hypotheses together in the LF is to test projects[5]; for Rosenberg projects are "social experiments"—a series of causal relations (between inputs and outputs), the causality of which could be scientifically tested (Cooley, interview, 2011; see also Practical Concepts Inc. 1979). The LF matrix acts as "a laboratory bench, a mechanism for taking a squirming, live, living thing, such as a project" (Rosenberg 1983, p. 5).

Not only do we find science in the LF's focus on hypotheses and experimentation, but we also find a focus on numbers and quantification as part of an appeal to objectivity

[5] The LF was proposed for both designing and "for the re-examination of the original design of ongoing projects as a necessary prelude to evaluation" (Tuner 1976, p. 10).

(Porter 1996). This is most noticeable in the LF's "means of verification" and "objectively verifiable indicators" columns, which provides evidence about results. The source of data and numerical indicators are made explicit as a means to monitor the project by comparing hypotheses with numerical representations of what actually happened.

An experimental view is also sensitive to uncertainty as an intrinsic part of reality—a concern also shared in system theory over the uncertainty caused by the interaction between system elements. This is most notable in the LF's "assumptions" column: that the hypothesis is true under certain condition. The assumptions column was designed for project designers and managers to account for uncertainty. To make visible factors that are represented as uncontrollable. The classic managerial implication is that project managers should not be held accountable for that which they have no control over. For Rosenberg, "if we are formulating this hypothesis and we, and superior managers, agree that this hypothesis is possible, where, if I properly manage my inputs to produce outputs, and the purpose is not achieved, I am not a bad manager, necessarily" (Rosenberg, interview, 2011). The assumption column offers a visualization of the limits of management; it sets the "limits of responsibility" [6] of the manager as a way "to get out of the finger pointing mode" common in AID at the time.

[6] Rosenberg acknowledges the influence of contract writing. In particular the principle of letting stakeholders know what the contract is about so that it could be enforced (Rosenberg 1983, p 12). This requires stakeholders to agree on the LF matrix while freeing both parties from responsibility for things beyond their control. The grid identifies what is manageable.

This above view of the project as linked hypothesis, as experiment, and as uncertain became central to USAID's evaluation approach. Thus:

> The underlying assumption on which the entire concept of evaluation rests is the recognition that much of what AID is doing is experimental in nature and as such cannot be expected to be both relevant and successful in all cases. In fact, the development assistance process, like a scientific experiment, may be described as a series of hypotheses. We plan that if the donor and the recipient countries each provide certain inputs, then a predicted output will occur. This is the 'manageable' interest. We then hypothesize that if this output does occur, then certain economic or social changes will follow. We go on to hypothesize further that if these changes take place, then higher living standards or national income or political stability or other broad goals will be achieved. The evaluator first confirms that the management responsibility was met and, if not, analyzes what changes are needed to produce outputs. He then becomes the scientist who tests these hypotheses. Were they valid? If not, what explicit or implicit assumptions proved incorrect? It is in this examination of the development assumptions of significance that evaluation goes beyond monitoring and auditing. (USAID 1970, p. 7)

This notion of science informed how the LF's developers built on MBO's means-end chain; it articulated the relation between the systems' objectives as if-then hypothesis (in the narrative summary column). It also sensitized users to the project as an experiment and to uncertainty in project design and accountability (in the assumptions column). As the quote above shows, the notions of hypothesis, experimentation, and

uncertainty informed USAID's understanding of project evaluation.

6. Discussion and conclusion

Systems theory, MBO, and science informed the problematization of planning and evaluation in USAID in the 1960s and the subsequent development of the LF. These traditions were layered and built on one another; they were "logically interrelated" (Rosenberg 1983, p. 16) in their visual integration into LF. For instance, systems theory and the cybernetic principle of control informed how one report after another problematized project evaluation in AID: as not feeding into memory and future plans. Fry Consultants Inc.'s reports were amongst the first to problematize evaluation as a problem of planning: better planning was needed for better evaluation. Structured planning would generate structured evaluation outcomes that could be feed into future plans. To do this USAID's planning had to consider a few key principles: that a project is a system that is part of a larger program-system; that clear objectives be articulated for each one of these systems; and that these objectives feed into one another through a scientific, if-then, logic. Soon after, Practical Concepts Inc. inscribed these managerial and scientific principles into a 4 x 4, as a seemingly simple and concise visualization, an "elegant summary" (Posner, interview, 2011) that "could be passed around" (Daly, interview, 2011) and deployed throughout the field.

What has been "passed around" from funding agencies to NGOs is not a neutral tool (Ebrahim 2002; Fernando 2005; Wallace et al. 1997). These principles are informed by paradigms and theories that were prominent in the 1960s and these principles are inscribed into the LF; they persist. System analysis, MBO, and science are at the center of the hierarchy of objective in the LF's "narrative summary" column. Projects

and programs are seen as systems, each with their respective objectives that are hierarchically connected to one another. Science provides a hypothesis-based approach that connects these system objectives into one another. We also find these principles weaved into other parts of the LF. The "objectively verifiable indicators" and "means of verification" columns were designed along (a) the cybernetic principle of feedback for project managers to monitor the project's activities and results; and (b) the principle of scientific objectivity through observation and quantification. Through these principles, managers can quantitatively monitor and restore order to a system. Science is also implicated in how managers are held accountable through the "assumptions" column. It holds that the hypothesis (the project experiment) is true under certain condition: Funders can't hold project managers and designers accountable for development experiments that don't go as expected for reasons outside their control. This is the managerial principle of controllability.

The importance of discussing these traditions is to point out that project and program management could be different. These traditions inform the design of the LF, which in turn, provides a standardized way of seeing, representing, and intervening in international development (Scott 1998). Traditions both enable particular ways of seeing the world, but also occlude alternative visions and approaches to management (Oakes et al. 1998). So what might be occluded? Consider if international development were seen as a political rather than a rational, managerial, or scientific process. A visualization might then focus on political groupings, power dynamics, and socio-political effects. Under such a vision, political and social maps might be more relevant than technical and causal logics. Such a change in the mode of visualization shifts thinking about development choices (March 1978; Flyvbjerg

1998; Scott 1998). How management tools visualize matters (Busco and Quattrone 2015). Similarly what is occluded if management were not so focused on uncertainty and controllability? Uncertainty may be understood then not as limiting responsibility but as opportunities for imaginative or entrepreneurial activity, for adopting technologies of foolishness (March and Olsen 1976), where experimentation and playfulness would contrast with the approaches to management that are inscribed into the LF grid.

These management and scientific ideas not only informed the LF, though. As Martinez and Cooper (2019) show, the LF is connected to other devices that form part of its ecosystem: components of the LF, such as the hierarchy of objectives and its indicators, make their way into budgets, strategic plans, and operational plans. We can thus trace how the paradigms and traditions that informed the LF informed other project management and accountability tools in international development. The scope of these traditions also extend beyond international development, as they also find their articulation in other US Government tools and activities. For instance, in the mid 1960s McNamara and his team introduced into the Department of Defense a system of objectives and cost control formalized as Planning, programming and budgeting system (PPBS) that connected the broader *objective* of national security to the *subsystems* (missions) and programs (Chwastiak 2001; 2006). These traditions have also found their way into results-based management initiatives in the 1990s, such as the 1993 Government Performance Results Act (Gore 1993). The LF is arguably a precursor to the "logic models" (Corbeil 1986; McLaughlin and Jordan 1998) that are at the center of public management reforms in many governments (Hood 1991; Olson, Guthrie and Humphrey 1988; Pollitt and Bouckaert 2004; Krause 2010). For

Knowlton and Phillips (2012, p. 6):

> U.S. Agency for International Development's logical framework approach (Practical Concepts, Inc. 1971) and Claude Bennett's (1976) hierarchy of program effectiveness were among the earliest uses of the types of visual displays that have evolved into the program logic models we know today.

PPBS and results-based management tools such as logic models indicate the extent to which the traditions that we discussed in this study inform contemporary government administration. These traditions also inform some of the assumptions of cost benefit analysis (Clements 1995) and its more modern representation in social return on investment approaches (Hall et al. 2015; Arvidson, Lyon, McKay & Moro 2013). For a former Practical Concepts Inc. employee, "lessons from international development came back to influence public management" (Cooley, interview, 2011) through the LF.

Through the case study of the LF we learn about the management and scientific traditions that inform how state officials record complex social phenomena into a simplified grid-like vision (Scott 1998, p. 2; Jasanoff 2004). In this ambition to see, the state fits populations into its grid, enabling projects (such as the forests discussed in section 3) to be "'read' accurately from the tables and maps in the forester's office" (Scott 1998, p. 15). Scott's work on the state provides us with a starting point to study a state agency as it wrestled with how to "see" its development projects. We however focus less on how such state ambitions affect the field of development (see Martinez and Cooper [2017] for an example), and more on the dominant forms of thinking that

problematized and are inscribed into the state tool of visibility. This focus forces us to take seriously the complex of system analysis, objectives management, and experimental science inscribed into the LF—how "dominant interests are reflected in the form and functioning of a technology" (D'Adderio 2008, p. 773). Management and scientific traditions inform the "scripts," the principles that users engage with when performing the LF (D'Adderio 2008; Martinez and Cooper 2019).

Simplifying the world to fit into the state grid is also dangerous. A threat to the LF is its connection to bureaucracy—its commitment to the state-grid. For Rosenberg, the LF was designed as a tool that adds "rationality to bureaucracy," "shows the bright light of reason," and enables project teams to self-organize and manage (Rosenberg, interview, 2011; Rosenberg 1983). And yet, it can become its own iron cage, a procedure. This is significant, because "'proceduralized' [is the] most horrible word in the bureaucrat's jargon" (Drucker 1954, p. 133). Such procedural thinking is often a "substitute for judgement," in part because there is a "superstitious belief in the magical effect of printed forms that tries to fit things into 'patterns'" (ibid. p. 133). This procedural adherence to the LF grid can lead to "enforcement of a fixed format [which] tends to produce illogic… and is prone to rigidification and thus to blocking rather than aiding adaptation" (Gasper 2000, p. 17). This focus on procedure and rigidification is arguably at odds with the tradition of scientific experimentation[7] and the view of projects as a "squirming, live, living thing" (Rosenberg 1983, p. 5). This

[7] We would like to thank one of the reviewers for this observation. However, historical and sociological studies of science show that science itself can be quite conservative and unresponsive to innovation and novelty (Kuhn, 1962). Further, complaints that the LF stifles innovation may reflect the formalization of aid accountability and the power imbalances that are associated with increased scrutiny of, and accountability to, funders (Martinez and Cooper, 2017).

bureaucratic process-oriented approach found in the 1960s management traditions discussed above emphasizes means more than ends and undermines other ways of thinking—the project as alive and as experimentation. While the LF was designed with experimental science in mind, one often finds the "squirming, live, living" project "prone to rigidification" and ossified within the matrix—the living projects and scientific experimentation are subsumed into the LF-matrix-state-grid. Rosenberg's ambition to add "rationality to bureaucracy" is exactly what happened: this scientifically-informed tool became a component part of a state bureaucratic ambition to "see" and in so doing making the world in its image. Science, like rationality for Webber, becomes an "iron cage." For instance, one can experiment once the project is framed along the hierarchy of objectives and measured along the objectively verifiable indicators found in the LF. This framing, as the accounting literature has shown, is constitutive, it enables a certain way of performing it, and not other, as a procedure and not an experiment.

This study contributes to the study of the LF and the study of managerialism in NGOs. Studies have examined the LF in an organizational setting (Ebrahim 2002; Fernando 2005) and in the broader field of international development (Wallace et al. 1997; Wallace et al. 2006). Others have studied the LF's historical linkages to management thought (Fernando 2005; Krause 2014), to a scientific logic focused on "objective and robust experimental procedures" (Hall 2014, p. 322), and how its visual features and linguistic tags connect to other project management devices (Martinez and Cooper 2019). These studies have shown that the LF depoliticizes development interventions and prioritizes interventions with deliverable and measurable objectives. It assumes that everything that is important can be adequately

measured. The LF "has profoundly influenced the assumptions and management practices that shape the way humanitarian NGOs do their work" (Krause 2014, p. 91). That is, the LF alters NGO's work, the field of international development, and the other devices that are part of the project management ecosystem.

Krause and Fernando have previously examined some of the management concerns that informed USAID's approach to the LF. Like us they identify the agency's debates about evaluation, planning, and results management. Unlike them, however, we describe the management and scientific ideas that informed how USAID problematized evaluation and planning and how these ideas were later inscribed into the LF itself. We learn how these traditions are woven in during the problematization phase and how these are consolidated (and materialized) as a 4 x 4 matrix in the LF. Though this matrix, different scientific and management traditions are held together, informing how users engage with it (D'Adderio 2008; Martinez and Cooper 2019), and perform the way the state sees and intervenes at a distance.

We take a device-centered approach to study how systems theory, MBO, and science as experimentation are implicated in the "theory and paradigms that underpin current aid practices" (Wallace et al. 2006, p. 3). Such theory and paradigms can be traced to specific concerns and ideas about management in the mid 1960s. Tracing this is important because managerial discourses introduce a form of rationality, make some forms of expression possible and not others, and change how users think when visually articulated as a seemingly rational and scientific tool (Townley et al. 2003; Free and Qu 2011; Oakes et al. 1998). This is central to our understanding of the power of managerialism in NGOs (Roberts et al. 2006; Jones et al. 2011; Meyer et al.

2012; Hvenmark 2015) and in government more generally (Hood 1991; Olson, Guthrie and Humphrey 1988; Pollitt and Bouckaert 2004). These constitutive ideas and their related form of visualization persist, not only in how the LF informs NGOs work (Ebrahim 2002; Fernando 2015) and international development (Krause 2014; Wallace et al. 1997; Wallace et al. 2006), and how it plugs into other project management devices (Martinez and Cooper 2019), but also in the wave of reforms since then, from results based management in the 1990s to the current use of logic models in NGOs and government.

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FIGURES

Figure 1: Logical Framework

Narrative summary	Objectively verifiably indicators	Means of Verification	Assumptions
Program goal:			
Project purpose:			
Output: Results 1 Results 2. etc.			
Inputs: activities & resources Activity 1.1 Activity 1.2 Activity 2.1 Activity 2.2 etc.			

Source: Practical Concepts Inc. 1971

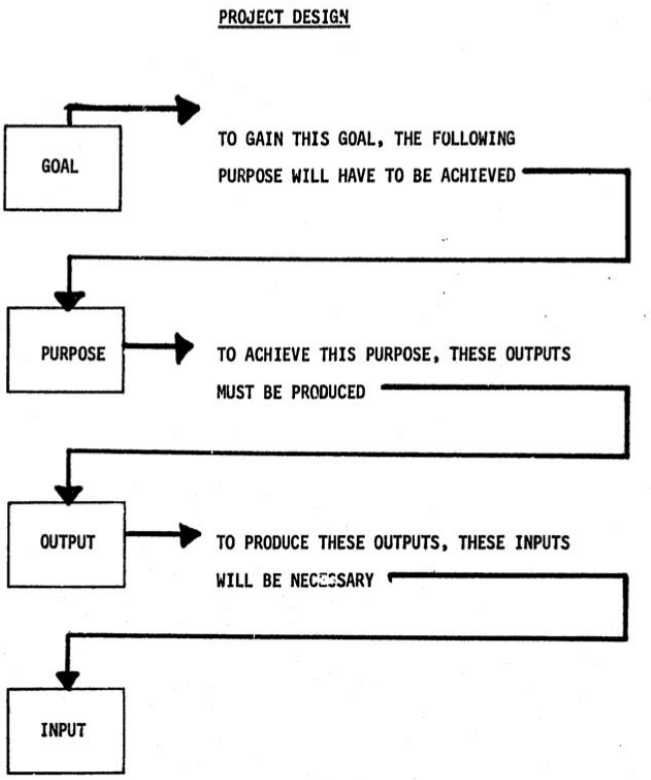

Figure 2: Project design as linked hypothesis

Source: Practical Concepts Inc. 1979, p. II-6

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Interviews

Name	Organization	Relevant position
Larry Cooley	Practical Concepts Inc.	Trainer 1970s
John Daly	USAID	Project evaluator 1970s- 90s
Lawrence Posner	Fry Consultants Inc. / Practical Concepts Inc.	LF developer and trainer 1960s-70s
Leon Rosenberg	Fry Consultants Inc. / Practical Concepts Inc.	LF developer and trainer 1960s-70s
Gerald Schwab	USAID	Program evaluation officer 1970s
Terry Schmidt	Practical Concepts Inc.	Trainer 1970s
Robert Youker	World Bank	Trainer 1970s-80s